ATTACHMENT A

Clean Replacement Claims

Please delete the following claims:

Please delete claims 1, 2, 10-12, 27-30, 35, 36, 37, 40, 41 and 42.

Please replace the following claims with the following clean claims as follows:

Claims 3, 4, 6, 7, 13, 14, 31 and 38.

Please add the following new claims:

Claims 43 and 44.

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3. (Amended) A method for measuring an amount of a peroxide or an amount of a peroxyl ion of a sample comprising the following steps:

(a) irradiating at least a portion of the sample with a laser light for generating a Raman spectrum of the sample;

(b) obtaining a Raman spectrum for obtaining at least two measurements at two different wavenumbers, a first measurement related to a Raman intensity related to an amount of a peroxide or an amount of a peroxyl ion, and a second measurement related to the other of an amount of a peroxide and an amount of a peroxyl ion;

(c) formulating a relationship between a Raman intensity for a peroxide and a Raman intensity for a peroxyl ion by comparing information related to the two measurements for determining the amount of a peroxide or the amount of a peroxyl ion; and,

(d) varying the amount of a peroxyl ion by varying a pH of the solution, wherein the relationship between the Raman intensity for a peroxide and the Raman intensity for a peroxyl ion is at least one of a product, a ratio, and a sum of the two measurements.

4. (Amended) A method as defined in claim 3 wherein an extent of bleaching is determined from the relationship, said extent of bleaching being related to an amount of a peroxide or an amount of a peroxyl ion.

6. (Amended) A method for measuring an amount of a peroxide or an amount of a peroxyl ion of a sample comprising the following steps:

(a) irradiating at least a portion of the sample with a laser light for generating a Raman spectrum of the sample;

(b) obtaining a Raman spectrum for obtaining at least two measurements at two different wavenumbers, a first measurement related to a Raman intensity related to an amount of a peroxide or an amount of a peroxyl ion, and a second measurement related to the other of an amount of a peroxide and an amount of a peroxyl ion;

(c) formulating a relationship between a Raman intensity for a peroxide and a Raman intensity for a peroxyl ion by comparing information related to the two measurements for determining the amount of a peroxide or the amount of a peroxyl ion; wherein the relationship between the Raman intensity for a peroxide and the Raman intensity for a peroxyl ion is at least one of a product, a ratio, and a sum of the two measurements and,

wherein the Raman intensity for a peroxide is obtained at approximately 877cm^{-1} and the Raman intensity for a peroxyl ion is obtained at approximately 850 cm^{-1}.

7. (Amended) A method for measuring an amount of a peroxide or an amount of a peroxyl ion of a sample comprising the following steps:

(a) irradiating at least a portion of the sample with a laser light for generating a Raman spectrum of the sample;

(b) obtaining a Raman spectrum for obtaining at least two measurements at two different wavenumbers, a first measurement related to a Raman intensity related to an amount of a peroxide or an amount of a peroxyl ion, and a second measurement related to the other of an amount of a peroxide and an amount of a peroxyl ion;

(c) formulating a relationship between a Raman intensity for a peroxide and a Raman intensity for a peroxyl ion by comparing information related to the two measurements for determining the amount of a peroxide or the amount of a peroxyl ion;

wherein the relationship between the Raman intensity for a peroxide and the Raman intensity for a peroxyl ion is at least one of a product, a ratio, and a sum of the two measurements and,

wherein a characteristic of a pulp or pulp effluent contained in the sample is determined from the relationship, said characteristic being one of pulp brightness, pulp yellowness, and bleaching efficiency.

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13. (Amended) A method for determining a property of a sample comprising the steps of:

(a) irradiating at least a portion of the sample with a laser light for generating a Raman emitted light from the sample;

(b) obtaining at least two measurements of the Raman emitted light between 200 cm^{-1} and 4000 cm^{-1}, a first measurement at a first wavenumber and a second measurement at a second wavenumber; and

(c) determining a non-linear relationship between the at least two measurements and the property of the sample,

wherein the non-linear relationship is determined by regression methods and,

wherein the non-linear relationship is expressed as at least one of the following functions between the property of the sample and the first and second measurement:

property of sample = f (first measurement, first measurement / second measurement);

property of sample = f (first measurement, first measurement * second measurement);

property of sample = f (first measurement, first measurement / (first measurement + second measurement)); and

property of sample = f (first measurement, (first measurement + second measurement) / first measurement).

14. (Amended) A method for determining a property of a sample comprising the steps of:

(a) irradiating at least a portion of the sample with a laser light for generating a Raman emitted light from the sample;

(b) obtaining at least two measurements of the Raman emitted light between 200 cm^{-1} and 4000 cm^{-1}, a first measurement at a first wavenumber and a second measurement at a second wavenumber;

(c) obtaining at least a third measurement of the Raman emitted light between 200 cm^{-1} and 4000 cm^{-1}; and,

(d) determining a non-linear relationship between the at least three measurements and the property of the sample,

wherein the non-linear relationship is determined by regression methods.

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31. (Amended) A method for determining a potential of an oxidative reductive process comprising the following steps:

(a) irradiating at least a portion of the sample with a laser light for generating a Raman emitted light from the sample;

(b) obtaining at least two measurements of the Raman emitted light between 200 cm^{-1} and 4000 cm^{-1}, a first measurement at a first wavenumber, and a second measurement at a second wavenumber; and

(c) determining a relationship between the two measurements and the potential of the oxidative reductive process,

wherein the relationship includes at least a ratio based on the two measurements and,

wherein the sample includes molecules with elements that exist in one of a plurality of oxidation states.

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38. (Amended) An apparatus for determining a property of a sample comprising:

a laser light source for irradiating at least a portion of the sample for generating a Raman emitted light from the sample;

a detector for detecting the Raman emitted light from the sample, said detector for obtaining at least two measurements of the Raman emitted light, a first measurement at a first wavenumber and a second measurement at a second wavenumber; and

a processor for receiving and processing data from the detector for determining a non-linear relationship between the at least two measurements and the property of the sample,

wherein the non-linear relationship is determined by regression methods and,

wherein the non-linear relationship is expressed as at least one of the following functions between the property of the sample and the first and second measurement:

property of sample = f (first measurement, first measurement / second measurement);

property of sample = f (first measurement, first measurement * second measurement);

property of sample = f (first measurement, first measurement / (first measurement + second measurement)); and

property of sample = f (first measurement, (first measurement + second measurement) / first measurement).

43. (New) A method as defined in claim 31 wherein the at least two measurements are Raman intensities and wherein at least one of the intensities is an intensity peak.

44. (New) A method as defined in claim 31 wherein the relationship is derived from a Nernst equation.